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Overview of Risk Factors for the Incidence of Malnutrition there are Toddlers in Tamalanrea District, Makassar City in 2019

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ABSTRACT

Poor nutrition is the condition of a person with below-average nutrition. This is a form of the process of chronic malnutrition. The purpose of the study: to determine the description of risk factors for malnutrition in children under five, including socioeconomic status, maternal education, frequency of infectious diseases, maternal knowledge, birth weight, and exclusive breastfeeding. This study is a descriptive study with a *cross sectional* design. The sample of this study used *purposive sampling* method. Atotal of 70 samples in this study, including 45 malnourished children under five and 25 not malnourished in Tamalanrea sub-district, Makassar City. Results of the study: malnutrition group as much as 84.4% were in low socioeconomic status, 62.2% came from the lowest education level n 73.4% were not exclusively breastfed, 66.7% had a history of low birth weight, 66.7% were born to mothers with a low level of maternal knowledge, and 60% had a history of high infectious diseases. Conclusions: socioeconomic level, mother's education level, mother's knowledge, birth weight of malnourished children tend to be lower than children who are not malnourished. Children with poor nutrition tend not to get exclusive breastfeeding, and the frequency of suffering from infectious diseases is more frequent than children who are not malnourished

INTRODUCTION

Nutrition is one of the most important factors affecting individuals or communities and is a fundamental *issue* in public health (Kurnia, 2014). The most vulnerable groups of people affected by nutritional problems are infants and toddlers because they need additional nutrition for growth and development, have limited energy reserves, and still depend on others (Baculu, 2015). Malnutrition is a condition where there is a deficiency, excess or imbalance of protein, energy and other nutrients that can cause impaired function in the body. In general, malnutrition is divided into two parts, namely *undernutrition* and *overnutrition*. *Undernutrition* or what we commonly know by the term (Poor Nutrition) consists of marasmus, kwashiorkor, and marasmus-kwashiorkor, while *overnutrition* is better known as obesity. Malnutrition that occurs in the early stages of life can increase the risk of infection, morbidity, and mortality along with decreased mental and cognitive development (Ari, 2014).

Nutritional status is the state of the body as a result of using, absorption, and use of food. Nutritional status in toddlers can affect several aspects. Undernutrition in toddlers, has a negative impact on motor development, inhibits behavioral and cognitive development which results in decreased learning achievement and social skills. Poor nutrition is a condition in which a person experiences nutritional deficiencies caused by low protein and energy intake, commonly known as *severely underweight*, namely children with a weight index according to the age of < -3 elementary school based on WHO-NCHS standard standards (Kurnia, 2012).

Theclassification of malnutrition is divided into 3, namely marasmus, kwashiorkor, and marasmus-kwashiorkor. Marasmus is a condition of lack of calories and energy while kwashiorkor is a condition where there is a lack of protein in large quantities, and marasmus-kwashiorkor is a mixture of several clinical symptoms of marasmus and kwashiorkor accompanied by symptoms of edema (Kliegman, 2017). According to data from WHO, the incidence of malnutrition in children under five in 2014 was 50 million children and malnutrition was 16 million children (WHO, 2015). Meanwhile, in Indonesia there was an increase in the incidence of undernutrition and malnutrition from 2010 by 17.9%, and 4.9% to 19.6%, and 5.7% in 2013. The South Sulawesi region is one of the regions with the 10th highest rank for the prevalence of undernutrition and malnutrition in toddlers, namely 25.6%, and 6.6% (Ministry of Health of the Republic of Indonesia, 2014). And the results of mapping conducted by the South Sulawesi Provincial Health Office for the highest prevalence of marasmus-kwashiorkor are in Makassar City, with a distribution of 16.39% undernourished, and 3.66% malnourished (Dinkes Prov. South Sulawesi, 2014).

Breast-feeding factors, history of premature birth, and low birth weight are the biggest risk factors (Kurnia, 2012). This is in accordance with several studies, namely, the results of the study there is a significant relationship between a history of infectious diseases, a history of exclusive breastfeeding, IMD to the incidence of malnutrition in toddlers. Further research in West Sumba Regency NTT in 2015 found that the most contributing risk factors were the frequency of illness of toddlers, family income, maternal knowledge about nutrition, frequency of going to posyandu, and sources of drinking water (Kurnia, 2012).

Another study in Humbang Hasundutan Regency in 2017 stated that children under five with families with low incomes were 14 times more likely to experience malnutrition. Low protein consumption, birth spacing, maternal age, parental knowledge, and the role of family members can be risk factors for undernutrition and malnutrition (Lilis, Nurdin, & Hermiyanti, 2017). Meanwhile, a study in Makassar City in 2018 found that a child suffering from *Acyatonic Congenital Heart Failure* had an impact on malnutrition (Jalaluddin et al, 2019).

Apart from the field of science and medicine how important it is to provide good nutrition and nutrition, the provision of good nutrition and nutrition is also explained in the Qur'an Surah Thaha verse 81:

كُلُوا۟ مِن طَيِّبَٰتِ مَا رَزَقْنَٰكُمْ وَلَا تَطْغَوْا۟ فِيهِ فَيَحِلَّ عَلَيْكُمْ غَضَبِى ۖ وَمَن يَحْلِلْ عَلَيْهِ غَضَبِى فَقَدْ هَوَىٰ ﴿٨١﴾

Means:

"Eat among the good sustenance which We have given you, and do not transgress the limits thereof, which cause my wrath to come upon you. And whosoever is afflicted by my wrath perishes."

The purpose of this study is to determine the picture of risk factors for malnutrition in children under five, including socioeconomic status, maternal education, frequency of infectious diseases, maternal knowledge, birth weight, and exclusive breastfeeding.

METHODS

This study uses descriptive research, which is a study conducted with the main purpose of describing or describing a population condition objectively. The type of descriptive research carried out is the observation method, which is a way of research carried out on quite a lot of objects in a certain time and uses quantitative research methods with a *Cross sectional* study design , yes, it obtains data at the time the research is carried out.

This research was conducted in the Tamalanrea District area of Makassar City. The study population was malnourished toddlers in Tamalanrea District, Makassar City with a total of 235 children. The sample of this study was taken using the *Purposive Sampling* method and the number of samples in this study amounted to children under five living in the Tamalanrea District area. And meet inclusion and exclusion criteria

The inclusion criteria in this study are:

1. Toddlers who are willing to participate in research (informed consent through parents/guardians)
2. Toddler (infant) with < 5 years old
3. Toddlers who have poor and poor nutritional status based on standard mmeasurement (BB/U)
4. Have complete medical record data that can be evaluated

The exclusion criteria in this study include:

1. Children under five who have mental disorders
2. Children under five who have congenital abnormalities
3. Toddlers who moved out of domicile during the study

To calculate the number of samples needed in this study, the calculation formula used is the slovin formula:

$$N = \frac{\text{n}}{1 + \text{n}\ (0{,}1)^2}$$

Information:

N: Number of known populations

d: The absolute error desired by the researcher and set at 10% (d = 0.1) with the calculation:

$$N = \frac{\text{n}}{1 + \text{n}\ (0{,}1)^2}$$

$$N = \frac{235}{1 + 235\ (0{,}1)^2}$$

$$N = \frac{235}{1 + 235\ (0{,}01)}$$

$$N = \frac{235}{1 + 2{,}35}$$

$$N = \frac{235}{3{,}35}$$

$$N = 70$$

Fromthe results of the calculation above, 70 samples were obtained that will be respondents to the results of this study.

Sampling technique

- Primary Data. Using data on independent variables such as food consumption history, birth weight history, parental factors, frequency of illness, socioeconomic status, obtained from research questionnaires through interviews.
- Secondary Data. includes an overview of the incidence of undernutrition and malnutrition in children under five in the Tamalanrea District, Makassar City, South Sulawesi Province from the local puskesmas

Research instruments

1. Questionnaires filled out based on the results of respondents' interviews
2. Inthe medical record of respondents to find out the risk factors for malnutrition in toddlers

Data analysis and processing

1. Data analysis

   The data that has been obtained is then presented in the frequency distribution table of *the Microsoft Excel* program. The processed data will be presented in table form accompanied by explanation in narrative form.
2. Data processing

   The stages of data processing areas follows:

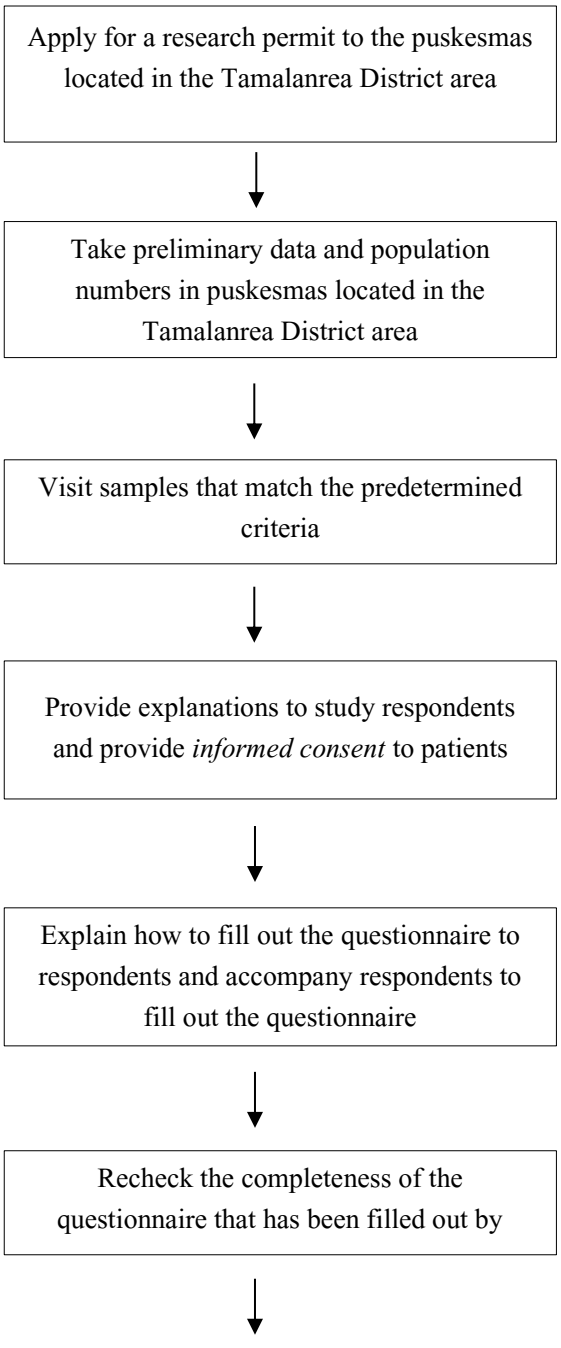
   - *Editing* is an effort made to re-check the completeness of the data that has been obtained so that the validity of the data can be guaranteed.
   - *Coding* is done to facilitate data processing, as well as to be the confidentiality of respondents' identities.
   - *Entry* is a process of entering data obtained using computer facilities.
   - *Cleaning.* The data collected is then carried out data cleaning, meaning that before processing, the data is checked first so that there is no data that is not needed.
   - *Tabulating. Processing and presenting data into the form of descriptive* tables aims to facilitate data analysis, data is entered in the form of descriptive tables.

Research ethics

Things related to ethics in this study are:

1) Include a research permit to the Makassar City Health Office for requests for medical record data and research permit applications.
2) Maintain the confidentiality of the patient's identity contained in the medical record, in the hope that no party feels disadvantaged for the research conducted.
3) Maintain and uphold good manners during the research process in the city of Makassar.

Research flow



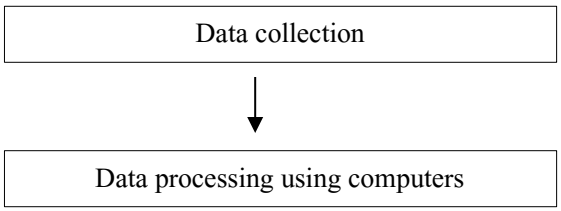


Figure 1. Research Flow

RESULTS AND DISCUSSION

Research Results

This research was conducted at the Puskesmas located in the working area of Tamalanrea District, Makassar City from February 5, 2020 to March 5, 2020. Samples in the study were taken by *Purposive Sampling* method that had met the inclusion and eklsui criteria. The number of samples in this study amounted to 70 samples each. The research design used in this study is a case control design using quantitative data. The data that has been obtained is then presented in the frequency distribution table of the *Microsoft Excel* program Based on the results of research and data processing carried out, the results of the research are presented as follows:

1. Univariate overview

a. Nutritional status of toddlers

Table 1. Frequency Distribution of Respondents' Nutritional Status

No.	Poor nutritional status	Frequency	
1	Yes (SD≤-3 SD)	45	64,3%
2	No (SD>-3 SD)	25	35,7%

Source: Data Processed(2020)

Based on the table above, it is known that from 70 total samples, there are 45 (64.3%) children under five with nutritional status in ≤-3 elementary school, and there are 25 (35.7%) children under five with nutritional status >-3 elementary school.

b. Socioeconomic status

Table 2. Frequency Distribution of Respondents by Socioeconomic Status

Socioeconomic level	Incidence of malnutrition			
	Yes		Not	
	n	%	n	%
<Rp.3,191,572 (Low)	38	84,4	8	32
>Rp.3,191,572 (Tinggi)	7	15,6	17	68
Total	45	100	25	100

Source: Data Processed(2020)

Based on the table above, it is known that from 45 total samples of patients with malnutrition, there are 38 (84.4%) families with low socioeconomic status, and there are 7 (15.6%) families with good socioeconomic status.while from 25 with patients who are not malnourished, there are 8 (32%) families with low socioeconomic status, and there are 17 (68%) families with high economic status.

c. Mother's educational history

Table 3. Frequency Distribution of Respondents Based on the Mother's Educational History

Education level	Poor nutritional status			
	Yes		Not	
	n	%	n	%
Elementary-Junior High School (low)	28	62,2	3	12
SMA-S1 (medium)	15	33,3	7	28
>S1 (height)	2	4,5	15	60
Total	45	100	25	100

Source: data processed(2020)

Based on the table above, it is known from a total of 70 samples. For malnourished patients, there were 28 (62.2%) mothers of patients with less education and 15

(33.3%) mothers of patients with moderate education and 2 (4.5%) mothers of patients with a high level of education. Then for those who are not malnourished there are 3 (12%) mothers with a low level of education and there are 7 (28%) mothers with a moderate level of education and 15 (60%) mothers with a high level of education.

d. History of exclusive breastfeeding

Table 4. Frequency Distribution of Respondents Based on History of Exclusive Breastfeeding

Exclusive breastfeeding	Poor nutritional status			
	Yes		Not	
	n	%	n	%
Yes	12	26,6	19	76
Not	33	73,4	6	24
Total	45	100	25	100

Source: Data Processed(2020)

Based on the table above, it is known from 70 total patient samples, In the malnutrition group, there were 33 (73.4%) children under five who were not exclusively breastfed, and there were 12 (26.6%) children under five who were given exclusive breastfeeding, then in samples that were not malnourished, there were 6 (24%) children under five who were not exclusively breastfed, and there were 19 (76%) children under five who were given exclusive breastfeeding.

e. History of birth weight

Table 5. Frequency Distribution Based on BBLR Events

History of Birth Weight<2500 grams	Poor nutritional status			
	Yes		Not	
	n	%	n	%
Yes	30	66,7	7	28
Not	15	33,3	18	72
Total	45	100	25	100

Source : Data Processed(2020)

Based on the table above, it is known from 70 total patient samples. The group with malnutrition status, there were 30 (66.7%) children under five with a history of low birth weight, and there were 15 (33.3%) children under five with a history of normal birth weight.then for the group that was not malnourished there were 7 (28%) children under five with a history of low birth weight, and there were 18 (72%) children under five with a history of normal birth weight.

f. Mother's level of knowledge

Table 6. Distribution of Respondents' Frequency Based on Mother's Level of Knowledge

Mother's level of knowledge	Poor nutritional status			
	Yes		Not	
	n	%	n	%
>70(Good)	3	6,6	15	60
50-70(enough)	12	26,7	7	28
<50	30	66,7	3	12
Total	45	100	25	100

Source : Data Processed(2020)

Based on the table above, it is known from 70 patient samples. In the group with malnutrition status, there were 30 (66.7%) mothers of patients with a lack of knowledge and there were 12 (26.7%) mothers of patients with sufficient knowledge and there were 3 (6.6%) mothers of patients with a good level of knowledge, then for those who were not malnourished, there were 3 (12%) mothers of patients with a lack of knowledge and there were 7 (28%) mothers of patients with sufficient knowledge and there were 15 (60%) mothers of patients with a level of knowledge knowledge is good.

g. History of infectious diseases

Table 7. Frequency of Infectious Diseases

Frequency of Infectious Diseases duringthe last 1 bullae n	Poor nutritional status			
	Yes		Not	
	n	%	n	%
≥4 times(High)	27	60	8	32
<4times(Low)	18	40	17	68
Total	45	100	25	100

Source : Data Processed(2020)

Based on the table above, it is known from 70 patient samples, groups with malnutrition status, there are 27 (60%) children under five who have a high frequency of infectious diseases, and there are 18 (40%) children under five who have a low frequency of infectious diseases Then for those who are not malnourished there are 8 (32%) children under five who have a high frequency of infectious diseases, And there are 17 (68%) children under five who have a low frequency of infectious diseases.

Discussion

1. Risk factors of exclusive breastfeeding against the incidence of malnutrition

Based on the results obtained, a total of 70 samples were obtained with several variables including exclusive breastfeeding. Among malnourished respondents, 73.4% were not exclusively breastfed, and among malnourished patients, 76% were exclusively breastfed. From these results, it was concluded that toddlers with poor nutrition did not get exclusive breastfeeding compared to infants / toddlers who did not suffer from gizi buruk.

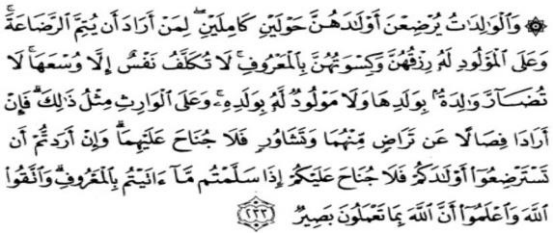
The results obtained in this study are in line with research conducted by Sihombing Natalia (2017) where there was a relationship between exclusive breastfeeding and the incidence of malnutrition in children under five with a p value of 0.030. Similar research was also conducted by Giri, et al (2013) showing that there is a relationship between exclusive breastfeeding and the nutritional status of toddlers in Kajanan Village, Buleleng.

Breast milk has great benefits for babies, including the nutritional content contained in breast milk, namely carbohydrates, proteins, and fats function as a source of energy for both the body and the brain. Some other benefits of breast milk include as a defense for the baby's immune system called yellowish colostrum fluid that comes out of the mother's breast in the first few hours contains immuunoglobulin A (Ig A) antibodies that function to coat the gastrointestinal tract so that germs do not enter the bloodstream and will protect the baby until the immune system functions properly. In addition, breast milk is also beneficial for children's growth and development and children's intelligence in the future (IDAI, 2013).

Apart from the field of science and medicine, the importance of exclusive breastfeeding is explained in the Qur'an, Surah Al-Baqarah, verse 233 as follows.

Means:

"Mothers should breastfeed their children for two full tabuns, that is, for those who want to perfect their breastfeeding. And it is the duty of the father to feed and clothe the mothers in



a ma'ruf way. A person is not burdened but according to the degree of his ability. Let not a mother suffer misery for her child and also a father for his child, and inheritance is obligated to do so. If both wish to wean (before two tabuns) with their willingness and deliberation, then there is no sin against both. And if you want your child to be breastfed by someone else, then there is no sin for you if you give

payment according to what is appropriate. Be fearful of Allah and know that Allah sees what you do."

Tafsir Ibn Kathir Surah Al-Baqarah verse 233

Mothers should breastfeed their children for two full years, that is, for those who want to perfect breastfeeding. And it is the duty of the father to feed and clothe the mothers in an accrued way. A person is not burdened but according to the degree of his ability. Let not a mother suffer misery for her child, and a father for his child, and heirs are obligated to do so. If both wish to wean (before two years) with their mutual willingness and deliberation, then there is no sin against both.

The results of this study underline that exclusive breastfeeding is highly recommended because the content of breast milk is very beneficial in the process of growth and development of children, therefore exclusive breastfeeding is highly recommended to be given to children for 0-6 months.

2. Risk factors for a history of frequency of infectious diseases to the incidence of malnutrition

From a total of 70 patient samples, among respondents with malnutrition, there were 60% of children under five who had a high frequency of infectious diseases, and among patients who were not malnourished there were 68% of children under five who had a low frequency of infectious diseases. From these results, it was concluded that toddlers with poor nutrition had more history of infectious diseases compared to infants / toddlers who did not suffer from malnutrition.

The results obtained in this study are in line with research conducted by Ernawati, (2016) where it was found that there was a relationship with the nutritional status of children under five in Kelapa Lima District, Kupang City. This can be caused because lack of nutritional intake can be the beginning of infectious diseases, due to impaired food absorption, and if this condition continues to occur for a long time it will result in nutritional malabsorption, and changes in body metabolism, which ultimately have an impact on the nutritional status of toddlers.

Maintaining cleanliness is an action that mothers can take to prevent infectious diseases, such as washing hands with soap, washing milk bottles and children's feeding places, washing and cleaning the ingredients to be processed, cooking food thoroughly, and keeping children from playing in a dirty environment. The lower a mother's awareness of the importance of maintaining cleanliness, the more vulnerable she will be to exposure to microorganisms or other infectious agents (Sihombing, 2017).

Islam teaches us to always maintain cleanliness in everything. The importance of clean living and maintaining hygiene so that microorganism germs do not easily multiply , because as we know bacteria or other microorganisms can multiply very quickly in parts that are not kept clean. Therefore, high awareness is needed for a mother to maintain cleanliness in order to reduce or prevent the occurrence of infectious diseases.

The results of this study underline the importance of a mother's awareness to always maintain cleanliness or hygiene so as to prevent the occurrence of diseases, both infectious diseases and other diseases. The higher the awareness of a mother to maintain cleanliness, it will be able to reduce or prevent the occurrence of infectious diseases.

3. Risk factors history of birth weight to the incidence of malnutrition

Among respondents with malnutrition, 66.7% were born with low body weight. And among patients who were not malnourished, there were (72%) respondents born with normal birth weight. From the results of this study, it can be concluded that toddlers with poor nutrition are more born with low body weight compared to infants / toddlers who do not suffer from malnutrition.

This research is in line with research by

Lestrina (2016) which found a relationship between a history of low birth weight (BBLR) with the nutritional status of children under five. Where babies born below normal (< 2500 grams) require greater nutritional needs than babies born normally, because they are susceptible to infectious diseases, and also susceptible to nutritional problems. Babies who have a history of low birth weight can result in slower growth and development, because since in the womb has experienced intrauterine growth *restriction* or fetal growth is inhibited so that long-term effects that can occur growth and development are slower than babies who do not have a history of low birth weight (Prawirohardjo, 2014).

The results of this study underline the importance of nutritional intake during pregnancy so that nutritional needs in the fetus can be met optimally so that fetal growth can be normal, and the importance of ANC care during pregnancy is very important so that during conditions during pregnancy can be monitored optimally and mothers get additional education or additional supplements that can be useful during pregnancy.

4. Mother's level of education and knowledge of the incidence of malnutrition

From a total of 70 patient samples, among respondents with malnutrition, 62.2% were born to mothers with low levels of education. And among patients who were not malnourished, 60% of respondents were born to mothers with a high level of education.

Then for maternal knowledge of nutrition, among respondents with malnutrition, there were 66.7% born to mothers with a lack of knowledge, and among patients who were not malnourished, there were 60% born to mothers with a high level of knowledge. From the results of this study, it can be concluded that toddlers with malnutrition are more born to mothers with low levels of education and knowledge compared to infants / toddlers who do not suffer from malnutrition.

This research is in line with the research of Sihombing Natalia (2017) where it was found that there is a relationship between the level of education and maternal knowledge related to nutritional problems in children under five. Education greatly influences the reception of information on nutrition. People with low education will find it more difficult to accept new information and change traditions or eating habits. The higher a person's education level, the easier he absorbs the information received including good and healthy nutritional information (Ernawati, 2016). Another study in Ethiopia showed that uneducated mothers had a 3.83-fold risk (OR= 3.83, 95% CI= 1.93 – 7.67), of having a child with severe malnutrition. The level of education is very influential on parenting, feeding patterns for children and their families. Mothers with good education tend to be more concerned about the health of their children. In addition, the level of education of parents is closely related to the socioeconomic family (Amsalu, 2018).

The results of this study underscore the importance of attention to women's health and rights. Improving women's access to good health services is the main task of the government that must continue to be pursued. Healthy and intelligent mothers will give birth to healthy and intelligent next generation.

5. Risk factors socioeconomic status to the incidence of malnutrition

From a total of 70 patient samples, among respondents with malnutrition there were 74.2% of respondents with parents who had low socioeconomic status, and among patients who were not malnourished there were 68% respondents with parents who had high socioeconomic status. From the results of this study, it can be concluded that childrenwith poor nutrition have more low economic status compared to infants / toddlers who do not suffer from bad health.

The results obtained in this study are in line with research conducted by Sihombing (2017) found that there is a relationship between family income and the incidence of malnutrition in children under five in the work area of the Saitnihuta Health Center.

Low family income results in limited buying of foodstuffs, causing food consumption to be reduced which can result in changes in children's weight and ultimately can experience malnutrition.

The results of this study underline that the higher the income of a family, the easier it will be to meet the daily nutritional needs of its family so that nutritional needs can be met optimally. Expansion or improvement to get jobs can be increased so that people can easily get jobs, so that their economic strata can increase so that it will be easy to meet the needs of daily nutrients

CONCLUSION

Somerisk factors for malnutrition in children under five are exclusive breastfeeding, history of infectious diseases, history of birth weight, level of education and knowledge of parents, and socioeconomic status. In addition, children with poor nutrition tend not to get exclusive breastfeeding, and the frequency of suffering from infectious diseases is more frequent than children who are not malnourished.

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